Science – Essential concepts and knowledge to be covered during the unit.

Year 1/2

Year A

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| Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Animals Including Humans – People and their Pets.  Year 1   * Be able to name and locate parts of the human body, including those relating to the senses. * Be able to identify and name different common animals including fish amphibians, reptiles, birds, and mammals. * Be able to describe and compare the observable features of animals from a range of groups. * Recognise that animals can be grouped according to whether they are carnivores, herbivores and omnivores. * Know the basic needs of animals for survival.   Year 2   * Know about the basic needs of animals, including humans, for survival. * Describe the importance of exercise, balanced diet and hygiene for humans. * Describe the main changes as young animals, including humans, grow into adults. | Everyday Materials – Brilliant Builders  Year 1   * Recognise the difference between the name of an object and the material from which it is made. * Identify a range of everyday materials including wood, plastic, glass, metal, water, and rock. * Describe the physical properties of everyday materials including hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy, waterproof/ not waterproof, absorbent/ not absorbent, opaque/ transparent. * Understand how to group everyday materials according to their physical properties.   Year 2   * Understand how everyday materials can be used for more than one thing. * Understand how different everyday materials can be used for the same thing. * Understand why the properties of materials make them suitable or unsuitable for particular purposes. * Recognise that squashing, bending, twisting, and stretching can change the shapes of solid objects made from some everyday materials. | Seasonal Changes – Weather Art  Year 1   * Understand and describe the main changes across the seasons. * Understand weather associated with the seasons. * Begin to record the direction of the wind and consider if it will change?   Year 2  Observe wind direction using a weathervane and compare the effectiveness of weathervane and windsock.   * Talk about what wind is like and what happens when the wind is very strong * Make a bottle wind spiral and spinner to explore the strength of the wind in the playground   Understand that the spinner is best for measuring wind strength and explore the idea of recording the results. | Everyday Materials –Exploring Changes  Year 1   * Understand that water is a material and ice is water in a different state * Observe and record the changes to a block of ice   Understand what happens to particles in ice when it starts to melt and turn to water.  Year 2   * Observe a block of ice, consider how to change its state, and make predictions   Devise an investigation to melt the ice quickly or slowly. | Plants – Art and nature  Year 1   * Be able to name a variety of different plants (including deciduous and evergreen trees). * Understand and describe the structure of plants including leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, and stem. * Understand why it is important for a plant to spread its seeds.   Year 2   * Understand and describe the main changes as seeds and bulbs grow into mature plants. * Understand what is meant by the words 'dispersal/disperse', pollination' and 'seed' * Understand what pollen is and the role it plays in helping to make new plants. | Living Things and their Habitats – habitats and homes  Year 1  Understand that growing conditions need to be right for plants to grow.   * Recognise whether things are alive, dead or have never lived. * Understand that creating different micro-habitats will encourage a variety of creatures * Understand that some invertebrates like cool, damp conditions and some prefer the sun, so the bug hotel will need to be located to incorporate both conditions. * Local study – importance of farming in Pensilva.   Year 2  Understand that different habitats provide for the basic needs of different kinds of mini-beasts and plants and that they depend on each other.  Make micro-habitats to encourage certain mini-beasts and create the right conditions to attract those specific living things. |

Year 3/4

Year A

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| Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Rocks  Learn the 3 different ways that rocks can be formed.   * Conduct a rock test for either hardness or permeability and try to make it fair. * Find evidence of rock erosion or how different rocks are used for different jobs and why. * Learn how fossils are made and record the stages through sequencing and illustrating (Yr3) or through writing and illustrating (Yr4) * Local study – rocks in Pensilva (Cheesewring, Hurlers) * Actively investigate and compare 3 different soils – to what extent different soils drain and absorb water (Yr4) and how the colour, size and proportion of the constituent parts may vary from soil to soil (Yr3). | Animals Including Humans: The circle of life.   * Use everyday objects to demonstrate peristalsis and the other workings of the digestive system * Label and explain the function of the various parts of the digestive system. * Eat a slice of apple and observe the function of different teeth in biting and chewing. * Write an explanation of the structure and function of the 4 types of teeth. * Explain the different diets of carnivores, herbivores and omnivores and know how you can deduce an animal’s diet by studying its teeth. Construct a food web and use it to derive information on predators, prey, producers and consumers. * Understand, reason and discuss the interconnectivity between living things in a food web. | Light  Actively investigate the nature of darkness, light and human sight with a torch.  Investigate which colours show up best in the dark and which are hard to see.   * Investigate how light reflects off mirrors and other shiny surfaces to give a clear reflection (Yr3)   Experiment with angles of reflection using strings attached to a mirror.  Discover the meaning of opaque, transparent and translucent and learn that each casts a different type of shadow.  Freely explore how the distance of the light source affects the size of a shadow.  Use secondary sources to research how rainbows are formed. | Electricity   * Actively explore how a bulb can be lit using a cell and 2 leads. * Draw their own conclusions that a continuous loop or circuit is necessary for electricity to flow. * Make predictions on which drawn “circuits” will work and which will not and give an explanation for their theory.   Test out their ideas and write their results in a table.  Discover the function of a switch and begin to learn electrical symbols for components.  Understand which materials are electrical conductors and which are insulators.    Understand the difference between an on/off switch and a pressure switch. | Living Things and Their Habitats – Habitat Helpers   * Discover that wildlife can be affected by human activity. * Understand the meaning of key scientific words like *habitat, ecosystem, survey* and *evidence.* * Undertake a habitat survey in the local environment.   Review the findings of their survey and consider the interdependence of the living things that make up that particular ecosystem.  Learn that living things are adapted to live in their habitat and describe some ways they do this.  Learn that climate change/global warming is caused by greenhouse gases that trap heat.  Discover that habitats can change disastrously because of the things humans throw away.  Discover that some habitats are lost because humans use the land for another purpose. | Plants   * Discuss and decide all the requirements they think plants need to grow strong and healthy.   Set up a plant growth investigation to test their theories.  Classify different foods as either root, stem/shoot, leaf, flower, fruit or seed.  Investigate the way in which water is transported within plants. |

Year 5/6

Year A

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| Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Earth and Space  Know that Galileo’s heliocentric view of the solar system was radical for its time.  Describe the movement of the Earth and other planets, relative to the sun in the solar system.  Explore time zones and relate this to the movement of the Earth.   * Match lunar phases to relative positions of the Moon, Sun and Earth. * Suggest (Y6) and carry out a simulation to demonstrate the moon’s changing appearance. * Label key features of the moon (Y5)   Research the relationship between the moon and the Earth’s tides (Y6)  Explore time zones and relate these to the movement of the Earth. | Properties of Materials – Special effects materials   * Plan and carry out investigations into the mixing and heating/cooling of solids & liquids.   Use sieving, filtration, evaporation and changes in temp. to reverse changes.   * Plan and carry out several investigations into solubility of different sugar formsexploring different solvents and temperatures with support (Y5) * Independently plan and carry out several investigations into solubility of different sugar forms exploring different solvents and temperatures (Y6) * Make observations of non-reversible chemical reactions (Y5)   Suggest explanations for and by-products of non-reversible chemical reactions (Y6)   * Observe rusting over time, recording findings and suggesting optimum conditions for rusting. * Know about some famous materials inventors. | Forces  Identify gravity and resistance forces, identifying balanced and unbalanced.  Investigate the effect of ground friction on the force needed to move a rolling car, taking accurate measurements and recording data effectively.  Set up and carry out a guided parachute investigation exploring shape, size and string length.  Investigate and suggest which shape of boat is best to beat the water resistance.  Complete a lever investigation, noting how the position of the fulcrum impacts on its effectiveness.   * Investigate how gears work, identify gear ratios and select possible outcomes from given gear ratios (Yr5)   Investigate how gears work, calculate some gear ratios and suggest possible outcomes from given gear ratios (Yr6). | Evolution and Inheritance   * Note animal and plant adaptations and select advantages or disadvantages of certain characteristics. * Extreme survival and adaptation - Explain how animals and plants might be adapted to extreme environments. * Research the life and work of Anning, Darwin or Wallace. * Complete online exploration of the evolution of flight in birds through the fossil record. * Create a cladogram using modern animals. * Explain scientifically how a given creature has evolved in terms of a specific characteristic. | Living Things and Their Habitats – The classification code   * Discuss Linnaeus and learn about his classification system.   Create (Yr6) and explore (Yr5) classification routes for given living things, identifying relatedness.   * Note and identify similarities and differences between animals, micro-organisms and plants.   Group animals and plants into broad groups then subgroups according to observable features.  Design, make and test classification keys to classify leaves found in the local environment.  Write scientific descriptions of unusual living things from around the world. | Revision  Plan and carry out investigations to observe the reaction of given solids in given liquids or mixture.  Create a timeline of knowledge development for some key areas of astronomy.  Identify the forces behind a range of phenomena.   * Explore some scientifically challenging living things to classify.   Research living things that have been re-classified as scientific knowledge about them has developed.  Define the term extinction and note whether it is a useful term.  Research and analyse the range of evidence for disputed concepts within the scientific community. |